

WHAT IS CLAIMED IS:

- 1 1. A method for performing workflow related operations, comprising:
2 receiving an application programming interface call (API) to perform a workflow
3 related operation;
4 determining at least one stored procedure call associated with the received API;
5 and
6 calling the determined at least one stored procedure to cause the execution of one
7 determined stored procedure on a database server to perform the workflow related
8 operation of the API.
- 1 2. The method of claim 1, wherein at least one stored procedure call invokes
2 one stored procedure in the database server that includes native workflow server code to
3 communicate to a workflow server to execute to perform the workflow related operation
4 of the API and wherein at least one stored procedure call invokes one stored procedure in
5 the database server that includes database statements executed by a database program to
6 access workflow related metadata for the API.
- 1 3. The method of claim 1, wherein the workflow related operation for at least
2 one API is to be performed on a workflow server and wherein the workflow related
3 operation for at least one API is to access workflow metadata from a workflow database
- 1 4. The method of claim 1, wherein the workflow related operation comprises
2 a function to perform on a workflow server, wherein the database server includes a
3 database program that executes one determined stored procedure to perform:
4 communicating native workflow server code included in the executed stored
5 procedure to the workflow server, wherein the workflow server executes the native
6 workflow server code to perform the workflow related operation of the API.

1 5. The method of claim 4, wherein the API and native workflow server code
2 are in different programming languages.

1 6. The method of claim 1, wherein the workflow related operation concerns
2 accessing workflow metadata in a workflow database, wherein the database server
3 includes a database program that executes one determined stored procedure to perform:
4 executing database statements included in the executed stored procedure to access
5 workflow metadata in the workflow database.

1 7. The method claim 3, wherein the database statements comprise Structured
2 Query Language (SQL) statements.

1 8. A method for performing workflow related operations at a database server
2 in communication with a client, comprising:
3 receiving at least one call to one stored procedure at the database server associated
4 with an application programming interface call (API) invoked from the client to perform
5 a workflow related operation; and
6 executing, at the database server, the at least one called stored procedure to
7 perform the workflow related operation of the API.

1 9. The method of claim 8, wherein the received at least one call to one stored
2 procedure comprises a first and second stored procedure calls to first and second stored
3 procedures, respectively, on the database server to implement the workflow related
4 operation of the API.

1 10. The method of claim 9, wherein executing the first stored procedure
2 comprises authenticating the client and establishing a connection and wherein executing

3 the second received stored procedure call comprises performing the workflow related
4 operation of the API.

1 11. The method of claim 9, wherein executing the first stored procedure
2 comprises accessing workflow metadata from a workflow database and wherein
3 executing the second stored procedure comprises communicating native workflow server
4 code and the accessed workflow metadata to a workflow server, wherein the workflow
5 server processes the communicated native workflow server code and the workflow
6 metadata to perform the workflow related operation of the API.

1 12. The method of claim 9, wherein executing the first stored procedure
2 comprises communicating native workflow server code to a workflow server, wherein the
3 workflow server processes the communicated native workflow server code to perform the
4 workflow related operation of the API and returns workflow metadata, and wherein
5 executing the second stored procedure call for the API comprises updates a workflow
6 database with the workflow metadata returned by the workflow server.

1 13. The method of claim 8, wherein the received call to the stored procedure
2 comprises a first call to a first stored procedure associated with a first API, wherein the
3 first stored procedure includes database statements, wherein executing the first stored
4 procedure comprises communicating the database statements to a database program to
5 access workflow metadata from a workflow database, further comprising:
6 receiving a second stored procedure call associated with a second API that
7 invokes a second stored procedure on the database server, wherein the second stored
8 procedure includes native workflow server code; and
9 executing the second stored procedure to communicate the native workflow server
10 code and the accessed workflow metadata included therein to a workflow server to
11 process to perform the workflow related operation associated with the second API.

1 14. The method of claim 13, wherein the first stored procedure returns the
2 accessed workflow metadata to the client, and wherein the second stored procedure call
3 from the client passes the accessed workflow metadata to the second stored procedure to
4 communicate to the workflow server with the native workflow server code.

1 15. The method of claim 8, wherein the received call to the stored procedure
2 comprises a first call to a first stored procedure associated with a first API, wherein the
3 first stored procedure includes native workflow server code, wherein executing the first
4 stored procedure comprises communicating the native workflow server code to a
5 workflow server to process to perform the workflow related operation associated with the
6 first API, wherein the workflow server returns workflow metadata, further comprising:
7 receiving a second stored procedure call associated with a second API that
8 invokes a second stored procedure on the database server, wherein the second stored
9 procedure includes database statements; and
10 executing the second stored procedure to cause a database program to execute the
11 database statements to update a workflow database with the returned workflow metadata.

1 16. The method of claim 14, wherein the first stored procedure returns the
2 returned workflow metadata from the workflow server to the client, and wherein the
3 second stored procedure call from the client passes the returned workflow metadata from
4 the workflow server to the second stored procedure to call the database program to update
5 the workflow database with the returned workflow metadata.

1 17. A system for performing workflow related operations, comprising:
2 a database server;
3 a computer readable medium including a plurality of stored procedures, wherein
4 each stored procedure is associated with at least one application programming interface

5 call (API) defined to perform a workflow related operation, wherein the computer
6 readable medium is accessible to the database server;
7 means for receiving one API call to perform one workflow related operation;
8 means for determining at least one stored procedure call associated with the
9 received API; and
10 means for calling the determined at least one stored procedure; and
11 means, performed by the database server, for executing the at least one called
12 stored procedure in response to the call to perform the workflow related operation of the
13 API.

1 18. The system of claim 17, wherein at least one stored procedure call invokes
2 one stored procedure that includes native workflow server code to perform the workflow
3 related operation of the API , and wherein at least one stored procedure call invokes one
4 stored procedure that includes database statements to access workflow related metadata
5 for the API, further comprising:
6 a workflow server;
7 a database;
8 means, performed by the workflow server, for receiving native workflow server
9 code from one stored procedure;
10 means, performed by the workflow server, for executing the received native
11 workflow server code to perform the workflow related operation; and
12 means for executing database statements from one stored procedure to access
13 workflow related metadata for the API from the database.

1 19. The system of claim 17, wherein the workflow related operation for at
2 least one API is to be performed on a workflow server and wherein the workflow related
3 operation for at least one API is to access workflow metadata from a workflow database

1 20. The system of claim 17, further comprising:
2 a workflow server, wherein the workflow related operation comprises a function
3 to perform on the workflow server;
4 means, performed at the database server, for executing one determined stored
5 procedure to communicate native workflow server code included in the executed stored
6 procedure to the workflow server; and
7 means, performed by the workflow server, for executing the native workflow
8 server code to perform the workflow related operation of the API.

1 21. The system of claim 20, wherein the API and native workflow server code
2 are in different programming languages.

1 22. The system of claim 17, further comprising:
2 a workflow database, wherein the workflow related operation concerns accessing
3 workflow metadata in the workflow database; and
4 means, performed at the database server, for executing the database statements in
5 the determined stored procedure to access workflow metadata in the workflow database.

1 23. The system claim 18, wherein the database statements comprise Structured
2 Query Language (SQL) statements.

1 24. A system for performing workflow related operations, comprising:
2 a database server;
3 a client in communication with the database server;
4 means, performed by the client, for executing an application programming
5 interface call (API) to perform a workflow related operation, wherein at least one stored
6 procedure at the database server is associated with the executed API;

7 means, performed by the client, for communicating the at least one call to at least
8 one stored procedure associated with the executed API to the database server; and
9 means, performed by the database server, for executing the at least one called
10 stored procedure to perform the workflow related operation of the API.

1 25. The system of claim 24, wherein the received at least one stored procedure
2 call comprises a first and second stored procedure calls to first and second stored
3 procedures, respectively, on the database server to implement the workflow related
4 operation of the API.

1 26. The system of claim 25, wherein the means for executing the at least one
2 called stored procedure performs executing the first stored procedure to authenticate the
3 client and establish a connection and wherein executing the second received stored
4 procedure call comprises performing the workflow related operation of the API.

1 27. The system of claim 25, further comprising:
2 a workflow database, wherein the means for executing the at least one called
3 stored procedure at the database server executes the first stored procedure to access
4 workflow metadata from the workflow database;
5 a workflow server, wherein the means for executing the second stored procedure
6 at the database server comprises communicating native workflow server code and the
7 accessed workflow metadata to the workflow server; and
8 means performed by the workflow server for processing the communicated native
9 workflow server code and the workflow metadata to perform the workflow related
10 operation of the API.

1 28. The system of claim 25, further comprising:
2 a workflow server, wherein the means for executing the at least one called stored
3 procedure at the database server executes the first stored procedure to communicate
4 native workflow server code to the workflow server;
5 means, performed by the workflow server, for processing the communicated
6 native workflow server code to perform the workflow related operation of the API and
7 returning workflow metadata; and
8 a workflow database, wherein the means for executing the at least one called
9 stored procedure executes the second stored procedure call for the API updates the
10 workflow database with the workflow metadata returned by the workflow server.

1 29. The system of claim 25, wherein the first stored procedure is associated
2 with a first API and includes database statements, further comprising:
3 a workflow database in communication with the database server;
4 means, performed by the database server, for accessing access workflow metadata
5 from the workflow database in response to executing the first stored procedure;
6 means, performed by the database server, for receiving the second stored
7 procedure call associated with a second API;
8 a workflow server;
9 wherein the means, performed by the database server, for executing the at least
10 one stored procedure performs:
11 (i) executing the second stored procedure including native workflow server
12 code; and
13 (ii) executing the second stored procedure to communicate the native
14 workflow server code and the accessed workflow metadata included therein to the
15 workflow server; and
16 means, performed by the workflow server, for executing the native workflow
17 server code communicated from the database server to process the workflow metadata

18 received from the database server to perform the workflow related operation associated
19 with he second API.

1 30. The system of claim 29, wherein the means for executing the at least one
2 stored procedure further performs executing the first stored procedure to return the
3 accessed workflow metadata to the client; and
4 means, performed by the client, for passing the accessed workflow metadata
5 received from the database server with the second stored procedure call to the database
6 server to communicate to the workflow server with the native workflow server code.

1 31. The system of claim 25, wherein the received call to the stored procedure
2 comprises a first call to a first stored procedure associated with a first API, wherein the
3 first stored procedure includes native workflow server code, further comprising:
4 a workflow server, wherein the means for executing the at least one stored
5 procedure performs executing the first stored procedure to communicate the native
6 workflow server code in the first stored procedure to the workflow server to process and
7 perform the workflow related operation associated with the first API;
8 means for returning, performed by the workflow server, workflow metadata,
9 wherein the means for executing the at least one stored procedure further performs
10 receiving the second stored procedure call associated with a second API that invokes the
11 second stored procedure on the database server, wherein the second stored procedure
12 includes database statements;
13 a workflow database; and
14 executing, at the database server, the database statements in the second stored
15 procedure to update the workflow database with the returned workflow metadata.

1 32. The system of claim 25, wherein the first stored procedure returns the
2 returned workflow metadata from the workflow server to the client, and wherein the

3 second stored procedure call from the client passes the returned workflow metadata from
4 the workflow server to the second stored procedure to call the database program to update
the workflow database with the returned workflow metadata.

1 33. An article of manufacture including code for performing workflow related
2 operations by:

3 receiving an application programming interface call (API) to perform a workflow
4 related operation;

5 determining at least one stored procedure call associated with the received API;

6 and

7 calling the determined at least one stored procedure to cause the execution of One
8 determined stored procedure on a database server to perform the workflow related
9 operation of the API.

1 34. The article of manufacture of claim 33, wherein at least one stored
2 procedure call invokes one stored procedure in the database server that includes native
3 workflow server code to communicate to a workflow server to execute to perform the
4 workflow related operation of the API and wherein at least one stored procedure call
5 invokes one stored procedure in the database server that includes database statements
6 executed by a database program to access workflow related metadata for the API.

1 35. The article of manufacture of claim 33, wherein the workflow related
2 operation for at least one API is to be performed on a workflow server and wherein the
3 workflow related operation for at least one API is to access workflow metadata from a
4 workflow database

1 36. The article of manufacture of claim 33, wherein the workflow related
2 operation comprises a function to perform on a workflow server, wherein the database

3 server includes a database program that executes one determined stored procedure to
4 perform:

5 communicating native workflow server code included in the executed stored
6 procedure to the workflow server, wherein the workflow server executes the native
7 workflow server code to perform the workflow related operation of the API.

1 37. The article of manufacture of claim 36, wherein the API and native
2 workflow server code are in different programming languages.

1 38. The article of manufacture of claim 33, wherein the workflow related
2 operation concerns accessing workflow metadata in a workflow database, wherein the
3 database server includes a database program that executes one determined stored
4 procedure to perform:
5 executing database statements included in the executed stored procedure to access
6 workflow metadata in the workflow database.

1 39. The article of manufacture of claim 37, wherein the database statements
2 comprise Structured Query Language (SQL) statements.

1 40. An article of manufacture including code for performing workflow related
2 operations at a database server in communication with a client by:
3 receiving at least one call to one stored procedure at the database server associated
4 with an application programming interface call (API) invoked from the client to perform
5 a workflow related operation; and
6 executing, at the database server, the at least one called stored procedure to
7 perform the workflow related operation of the API.

1 41. The article of manufacture of claim 40, wherein the received at least one
2 call to one stored procedure comprises a first and second stored procedure calls to first
3 and second stored procedures, respectively, on the database server to implement the
4 workflow related operation of the API.

1 42. The article of manufacture of claim 41, wherein executing the first stored
2 procedure comprises authenticating the client and establishing a connection and wherein
3 executing the second received stored procedure call comprises performing the workflow
4 related operation of the API.

1 43. The article of manufacture of claim 41, wherein executing the first stored
2 procedure comprises accessing workflow metadata from a workflow database and
3 wherein executing the second stored procedure comprises communicating native
4 workflow server code and the accessed workflow metadata to a workflow server, wherein
5 the workflow server processes the communicated native workflow server code and the
6 workflow metadata to perform the workflow related operation of the API.

1 44. The article of manufacture of claim 41, wherein executing the first stored
2 procedure comprises communicating native workflow server code to a workflow server,
3 wherein the workflow server processes the communicated native workflow server code to
4 perform the workflow related operation of the API and returns workflow metadata, and
5 wherein executing the second stored procedure call for the API comprises updates a
6 workflow database with the workflow metadata returned by the workflow server.

1 45. The article of manufacture of claim 40, wherein the received call to the
2 stored procedure comprises a first call to a first stored procedure associated with a first
3 API, wherein the first stored procedure includes database statements, wherein executing

4 the first stored procedure comprises communicating the database statements to a database
5 program to access workflow metadata from a workflow database, further comprising:
6 receiving a second stored procedure call associated with a second API that
7 invokes a second stored procedure on the database server, wherein the second stored
8 procedure includes native workflow server code; and
9 executing the second stored procedure to communicate the native workflow server
10 code and the accessed workflow metadata included therein to a workflow server to
11 process to perform the workflow related operation associated with the second API.

1 46. The article of manufacture of claim 45, wherein the first stored procedure
2 returns the accessed workflow metadata to the client, and wherein the second stored
3 procedure call from the client passes the accessed workflow metadata to the second stored
4 procedure to communicate to the workflow server with the native workflow server code.

1 47. The article of manufacture of claim 40, wherein the received call to the
2 stored procedure comprises a first call to a first stored procedure associated with a first
3 API, wherein the first stored procedure includes native workflow server code, wherein
4 executing the first stored procedure comprises communicating the native workflow server
5 code to a workflow server to process to perform the workflow related operation
6 associated with the first API, wherein the workflow server returns workflow metadata,
7 further comprising:
8 receiving a second stored procedure call associated with a second API that
9 invokes a second stored procedure on the database server, wherein the second stored
10 procedure includes database statements;
11 executing the second stored procedure to cause a database program to execute the
12 database statements to update a workflow database with the returned workflow metadata.

48. The article of manufacture of claim 47, wherein the first stored procedure returns the returned workflow metadata from the workflow server to the client, and wherein the second stored procedure call from the client passes the returned workflow metadata from the workflow server to the second stored procedure to call the database program to update the workflow database with the returned workflow metadata.